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| 10/591,176 | 08/30/2006 | Atsushi Sano | 129277 | 7454 |
| 25944 7590 09/19/2011 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850 | | | | |
| EXAMINER | | | | |
| BEST, ZACHARY P | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1727 | | | | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
| 09/19/2011 | | ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/591,176

Applicant(s)

SANO ET AL.

Examiner

ZACHARY BEST

Art Unit

1727

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 7,8,15 and 17 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 7,8,15 and 17 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SD-603)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DIRECT ALCOHOL FUEL CELL AND METHOD FOR PRODUCING THE SAME

Examiner: Z. Best S.N. 10/591,176 Art Unit: 1727

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 15, 2011 has been entered. Claim 7 was amended. No new matter was added. Claims 7-8, 15, and 17 are currently pending examination.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 7-8, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sterzel (US 4,828,941) in view of Jaouen (US 2004/0028992 A1).

Regarding Claim 7, Sterzel teaches a direct alcohol fuel cell (abstract) comprising an anode having an anode catalyst layer (2), a cathode having a cathode catalyst layer (3), and a solid polymer electrolyte membrane arranged between the anode and cathode (1), the direct

alcohol fuel cell generating electricity by supplying the anode with alcohol and water (col. 8, lines 5-19); wherein the solid polymer electrolyte membrane is an anion exchange membrane (col. 2, lines 52-55); wherein the cathode catalyst layer contains silver as a catalyst (col. 48-50); and wherein the cathode catalyst layer contains an anion exchange resin as a binder (see col. 5, lines 46-50, see generally col. 5, lines 1-50). However, Sterzel fail to teach the catalyst is bound by the anion exchange resin in the cathode catalyst layer.

Jaouen teaches a cathode layer structure for a solid polymer fuel cell (abstract) wherein the catalyst (10) is embedded (bound) in the anion exchange polymer (12) in the cathode catalyst layer (48) thereby forming an interface between the catalyst, the anion exchange resin, and the membrane (see par. 27) so as to have faster kinetics for the oxygen reduction reaction which takes place at the cathode side (abstract, par. 6, see also par. 28). Therefore, it would have been obvious at the time the invention was made to embed the catalyst in the anion exchange polymer of Sterzel because Jaouen teaches the catalyst embedded (bound) in the anion exchange polymer in the cathode catalyst layer will have faster kinetics for the oxygen reduction reaction which takes place at the cathode side.

Regarding Claim 8, Sterzel teaches the catalyst includes a carrier catalyst having a carbon material carrying the silver (col. 3, lines 32-50).

Regarding Claim 15, Sterzel teaches the anion exchange membrane is constituted by a polymer compound having a cation group within a molecule (col. 5, lines 28-42).

Regarding Claim 17, Sterzel teaches the alcohol is methanol (abstract).

Response to Arguments

4. Applicant's arguments filed August 15, 2011 have been fully considered but they are not persuasive.

Applicant argues:

(a) in Jaouen, the cation conducting polymer is always interposed between the anion conducting polymer (and catalyst), and electrolyte membrane, thereby the claimed contact interface would not occur.

In response to Applicant's arguments:

(a) As an initial matter, Applicant seems to be wholly combining the all of Jaouen in to Sterzel without any indication or argument as to why that is necessary. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case the motivation for the catalyst to be bound by the anion exchange resin in the fuel cell of Sterzel is because Jaouen teach that improved properties are gained by having the catalyst surrounded by the anion exchange polymer. Applicant has failed to explain why one skilled in the art would find it necessary to also include cation exchange polymer of Jaouen in to the fuel cell of Sterzel.

Regardless, Jaouen specifically teach mixing the anion exchange polymer with supported catalyst and spraying onto the membrane (par. 27), and thereafter spraying the cation exchange polymer on to the membrane (par. 27), which is better than not having all the catalyst surrounded by the anion exchange resin (par. 28). If the anion exchange polymer is sprayed directly on to the membrane, Examiner is unsure as to why Applicant believes the cation conducting polymer sprayed thereafter would prevent the claimed interface. Applicant points to no citation or support in making this allegation. It is further noted that Sterzel specifically teaches that the same coating processes are used for the anion exchanger polymer and the catalyst (col. 6, ll. 51-55).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZACHARY BEST whose telephone number is (571)270-3963. The examiner can normally be reached on Monday to Thursday, 8:30 - 6:00 (Eastern).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ZACHARY BEST/
Examiner, Art Unit 1727

/Barbara L. Gilliam/

Supervisory Patent Examiner, Art Unit 1727